9. The method of manipulating particles according to claim 1, wherein the material that produces a local magnetic field and has a high moment low remnant field is a nickel-iron alloy.

10. The method of manipulating magnetic particles according to claim 1, wherein each of the spin valve magnetic traps comprise a multilayered spin-valve structure having two discrete magnetic layers encased in a multiple layer structure that together can selectively have either parallel or anti-parallel magnetic moments when subjected to the magnetic field to produce in total a local magnetic field that is capable of attracting and restraining and subsequently releasing magnetic particles near the spin valve magnetic traps.

11. The method of manipulating magnetic particles according to claim 1, wherein each of the spin valve magnetic traps are arranged in an array and are sized to attract and restrain individual cells, molecules, or polymers that are magnetically tagged.

12. The method of manipulating magnetic particles according to claim 1, further comprising selectively applying a second auxiliary magnetic field to one or more of the plurality of spin valve magnetic traps to cause at least one or more magnetic particles held by the local magnetic field to rotate or move.

13. The method of manipulating magnetic particles according to claim 1, further comprising selectively applying a second magnetic field to one or more of the plurality of spin valve magnetic traps to cause at least one or more magnetic particles held by the local magnetic fields to be placed under tension or torsion.

14. The method of manipulating magnetic particles according to claim 1, further comprising using a moving magnetic tipped probe to provide a second auxiliary field to move one or more of the magnetic particles to desired locations near the spin valve magnetic traps.

15. The method of manipulating magnetic particles according to claim 14, wherein the magnetic tipped probe comprises a magnetic force microscope cantilever.

16. The method of claim 1, wherein the plurality of spin valve magnetic traps each comprise a multilayered spin-valve structure having two discrete magnetic layers encased in a multiple layer structure that together can selectively have either parallel or anti-parallel magnetic moments when subjected to the magnetic field to produce in total the local magnetic fields near the individual spin valve magnetic traps that are capable of attracting and retaining and subsequently releasing the magnetic particles by the spin valve magnetic traps.

17. The method of claim 1, wherein the plurality of spin valve magnetic traps each comprise a multilayered spin-valve structure having the following sequence of layers: a layer of tantalum, a layer of nickel-iron alloy, a layer of cobalt, a layer of copper, a layer of cobalt, a layer of nickel-iron alloy, a layer of IrMn and a layer of tantalum, wherein the layers of the nickel-iron alloy can selectively have either parallel or anti-parallel magnetic moments when subjected to the magnetic field to produce in total the local magnetic fields near the individual spin valve magnetic traps that are capable of attracting and retaining and subsequently releasing the magnetic particles by the spin valve magnetic traps.

18. A method of manipulating magnetic particles, comprising the steps of:

providing a fluid having a plurality of magnetic particles dispersed therein;

providing a plurality of spin valve magnetic traps attached to a membrane, each of the plurality of spin valve magnetic traps being switchable between an on state and an off state when temporarily subjected to a magnetic field of sufficient strength to change the magnetization state of the spin valve trap, (a) the on state characterized in that the spin valve magnetic trap produces its own local magnetic field which persists after the temporary magnetic field is discontinued, said produced local magnetic field being capable of attracting and indefinitely retaining the magnetic particles proximate the spin valve magnetic trap, and (b) the off state characterized in that no local magnetic field is produced by the spin valve magnetic trap and the magnetic particles are not attracted or retained proximate the spin valve magnetic trap;

bringing the fluid having the magnetic particles dispersed therein proximate the array of spin valve magnetic traps; and

attracting and retaining the magnetic particles proximate one or more of the plurality of spin valve magnetic traps by temporarily subjecting the spin valve magnetic traps to the magnetic field so as to selectively switch one or more of the spin valve magnetic traps between the on and off states thereof.

19. The method of claim 18, wherein the plurality of spin valve magnetic traps are individually switchable between the on and off states thereof, and wherein the step of attracting and retaining magnetic particles proximate one or more of the plurality of spin valve magnetic traps comprises individually temporarily subjecting each spin valve magnetic trap to the magnetic field so as to selectively switch each spin valve magnetic trap between the on and off states thereof.

20. The method of claim 18, wherein the plurality of spin valve magnetic traps are globally switchable between the on and off states thereof, and wherein the step of attracting and retaining magnetic particles proximate one or more of the plurality of spin valve magnetic traps comprises globally temporarily subjecting the plurality of spin valve magnetic traps to the magnetic field so as to selectively switch all of the plurality of spin valve magnetic traps between the on and off states thereof.

21. The method of claim 18, wherein the plurality of spin valve magnetic traps are both individually and globally switchable between the on and off states thereof, and wherein the step of attracting and retaining magnetic particles proximate one or more of the plurality of spin valve magnetic traps comprises one of (a) individually temporarily subjecting each spin valve magnetic trap to the magnetic field so as to selectively switch each spin valve magnetic trap between the on and off states thereof, or (b) globally temporarily subjecting the plurality of spin valve magnetic traps to the magnetic field so as to selectively switch all of the plurality of spin valve magnetic traps between the on and off states thereof.

22. The method of claim 18, wherein the membrane is at least partially free-standing so as to define opposite surfaces, wherein the plurality of spin valve magnetic traps are attached to one of the opposite surfaces of the membrane, and wherein the fluid having the magnetic particles dispersed therein is brought proximate the array of spin valve magnetic traps on the other of the opposite surfaces of the membrane so that the membrane provides a barrier between the fluid and the plurality of spin valve magnetic traps.

23. The method of claim 18, wherein the plurality of spin valve magnetic traps each comprise a multilayered spin-valve structure having two discrete magnetic layers encased in a multiple layer structure that together can selectively have either parallel or anti-parallel magnetic moments when subjected to the magnetic field to produce in total the local magnetic fields near the individual spin valve magnetic traps